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ASBESTOS ABATEMENT DESIGN

FORMER WILLOWBROOK MILL
215 BONVIEW AVENUE
LINCOLNTON, NORTH CAROLINA

BY

DUNCKLEE & DUNHAM, PC
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DESIGNER: Doug Weaver **DATE: July 16, 2020**
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SECTION 01043

PROJECT COORDINATION

1.01 GENERAL

A. All asbestos abatement contractors will be licensed general contractors in either the specialty interior, building, unclassified or asbestos categories by the North Carolina Licensing Board of General Contractors and limited for the bid amount.

B. The contractor shall be responsible for inspecting the site prior to bidding to confirm the scope of the work. Any quantities listed by the designer in the plans, specifications or survey are done so as approximations. The actual quantities of asbestos-containing material to be encountered are the responsibility of the contractor.

C. The contractor shall furnish and is responsible for all costs including, but not limited to: permit fees, containment preparation, labor, materials, services, insurance, bonding, and equipment necessary to carry out the abatement operations and disposal of all asbestos material in accordance with the plans and specifications, the EPA and OSHA regulations, and any applicable state and local government regulations.

D. The contractor/employer has and assumes the responsibility of proceeding in such a manner that he offers his employees a workplace free of recognized hazards causing or likely to cause death or serious injury. The contractor shall be responsible for performing this abatement and disposal so that airborne asbestos fiber levels do not exceed established levels.

E. The contractor will be responsible for all costs associated with employee monitoring to meet the OSHA requirements.

F. The contractor is responsible for all costs, including additional visits, should the designer and/or the industrial hygiene firm determine that the contractor failed a final inspection. Notification and scheduling of the final inspection during the project is the responsibility of the contractor. The contractor will allow a minimum notice of 48 hours unless a different time frame is agreed upon by the designer and the contractor.

1.02 PERSONNEL

A. Supervisor

1. All supervisors shall be accredited by the Health Hazards Control Unit (HHCU).

2. All supervisors on the project shall have two years' experience in the administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc.

3. One supervisor shall be provided for every 10 workers inside the containment. A minimum of one supervisor shall be provided per project.

4. The contractor shall have at least one employee on the job site in either a foreman or supervisor's position who is bilingual in the appropriate languages when employing workers who do not speak fluent English.

5. A minimum of one supervisor per company shall have attended a 24-hour respiratory protection course.

B. Worker

1. All workers shall be accredited by the HHCU.

C. Competent Person

1. A competent person, as defined in the OSHA asbestos standard 29 CFR 1926.1101, employed by the contractor must be outside the work area at all times to monitor activity, ensure containment security, provide information to visitors, and provide access to the work area.

D. Employees

1. The contractor is responsible for the behavior of workers within his employment. If at any time during the contracted work, any of his employees are judged to exhibit behavior unfitting for the area or judged to be a nuisance by the owner or designer, the contractor shall remove them immediately from the project.

2. The contractor shall be responsible for compliance with the following concerning employee behavior:

   a. Under no circumstances are alcohol, drugs or any other type of controlled substances permitted on the property.

   b. All workers are restricted to the construction project site only.

   c. All vehicles must be parked in areas prearranged with the owner.

   d. All workers must conform to the following basic dress code when in public areas of the project confines: long pants, shirts, no tank tops, no shorts, no bare backs.

   e. The contractor is responsible for disposal of all trash brought on the property by his employees, including drink cans, bottles or other food containers and wrappers.

3. Failure to adhere to these rules could result in criminal prosecution and/or removal from the property.

1.03 MEETINGS

A. A pre bid conference will be held by the designer. All contractors submitting a bid are encouraged to attend, visit the site, and ask questions concerning the plans and specifications.

B. The designer will review the plans and specifications, present required techniques, and safeguards for the removal of the asbestos and identify locations of water, electrical sources, etc.

C. Any minutes, new points or clarifications raised during the meeting will be issued by the designer in an addendum seven days prior to bids.

1.04 PRE-JOB SUBMITTALS

A. Submit three complete, bound sets of pre-job submittals to the designer at least 10 days prior to the start of work. Work is prohibited until submittal package has been reviewed and approved by designer. A copy of the approved submittals shall be kept in a three-ring binder (project log) by the contractor at the project site in the clean room or in the on-site office of the contractor.

1. Notifications: Provide copies of Asbestos Permit Application and Notification for Demolition/Renovation (DEHNR 3768), which provide written notice to all required agencies, including North Carolina HHCU. Provide notification letters to local EMS, fire and police departments (as required).

2. Employee List: Provide copies of lists of supervisors and workers, along with their accreditation and Social Security numbers, to be utilized on the project.

3. Permits: Provide copies of approval of a waste disposal site in compliance with 40 CFR 61.154.

4. Medical: Provide individually signed forms by each worker to be utilized on the project documenting that each is actively involved in a company employee medical surveillance program.

5. Respirator Training: Copies of most recent fit testing records, individually signed for each worker to be utilized on the project.

6. Project Schedule: Time schedule for the project, outlining the proposed start, setup, clearances, etc. for the various phases of the project.

7. Initial Exposure Assessment: As required by the OSHA construction asbestos standard 29 CFR 1926.1101.

8. Any other programs or training as outlined by the OSHA and EPA standards.

1.05 POST-JOB SUBMITTALS

A. Submit three complete, bound sets of post-job submittals to the designer following the final completion of the work. Requests for final payment will not be approved until the submittal package has been reviewed and approved by the designer.

1. Affidavits: Contractor’s affidavit of payment of debts and claims, affidavit of release of liens, and consent of surety company to final payment

2. Manifest: North Carolina Asbestos Waste Shipment Record (DEHNR 3787) receipt from landfill operator which acknowledges the contractor's delivery(s) of waste material. Include date, quantity of material delivered and signature of authorized representative of landfill. Also, include name of waste transporter. Include waste manifests for other hazardous materials detailed in Section 02085.

3. Daily Log: A notarized copy of all daily logs showing the following: name, date, entering and leaving time, company or agency represented, reason for entry for all persons entering the work area, employee's daily air monitoring data as required by the OSHA standard and written comments by inspectors, industrial hygienists, designers and visitors.

4. Medical: Copies of worker release forms, asbestos training certification forms and respirator training documentation of all new employees hired during the project.

5. Special Reports: All documents generated under Section 01043.1.06.

1.06 SPECIAL REPORTS

A. General: Except as otherwise indicated, submit special reports to designer within one day of occurrence requiring special report, with copies to others affected by occurrence. Also keep a copy in the project logbook.

B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of negative pressure system, rupture of temporary enclosures), prepare and submit a special report to the designer immediately, listing chain of events, persons participating, response by contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise designer in advance at earliest possible date.

C. Reporting Accidents: Prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document date and actions; comply with industry standards for reporting accidents. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

1.07 CONTINGENCY PLAN

A. Contingency Plan: Prepare a contingency plan for emergencies including fire, accident, power failure, negative pressure system failure, supplied air system failure (if applicable), evacuation of injured persons for both life threatening and non-life threatening, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Keep these plans in the on-site office.

B. Post outside/in clean room of Personnel Decontamination Unit:

1. Telephone numbers and locations of emergency services including but not limited to, fire, ambulance, doctor, hospital, police, power company, telephone company and the North Carolina HHCU.

2. A copy of Material Safety Data Sheets (MSDS) for any chemicals used during the asbestos project.

3. The contractor shall post asbestos signs in each appropriate language as per the OSHA 29 CFR 1926.1101 standard.

SECTION 01092

CODES AND REGULATIONS

1.01 REFERENCE SPECIFICATIONS

The contractor shall assume full responsibility and liability for compliance with all applicable federal, state and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

Unless modified by these project specifications, all specifications for stripping, removal, repair and disposal work shall conform to the following specifications and standards, as applicable, as if completely reproduced herein.

A. The following regulations published by the Environmental Protection Agency (EPA):

1. "National Emissions Standards for Hazardous Air Pollutants Asbestos," 40 CFR Part 61, Subpart M.

2. "General Provisions," 40 CFR Part 61, Subpart A.

3. "Guidance for Controlling Asbestos-Containing Materials in Buildings" June 1985. (EPA # 560/5-85-024).

4. "Asbestos-Containing Materials in Schools," 40 CFR Part 763, Subpart E including appendices.

B. The following regulations published by the U.S. Department of Labor, OSHA:

1. “Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules,” Title 29, Part 1910, Section 1001 and Part 1926, Section 1101 of the Code of Federal Regulations.

2. “Respiratory Protection,” Title 29, Part 1910, Section 134 of the Code of Federal Regulations.

3. Construction Industry, Title 29, Part 1926, of the Code of Federal Regulations.

4. “Access to Employee Exposure and Medical Records,” Title 29, Part 1910, Section 20 of the Code of Federal Regulations.

5. “Hazard Communication,” Title 29, Part 1926, Section 59 of the Code of Federal Regulations.

6. “Specifications for Accident Prevention Signs and Tags,” Title 29, Part 1910, Section 145 of the Code of Federal Regulations.

C. The following regulations published by North Carolina state agencies:

1. North Carolina Asbestos Hazard Management Program Rules as adopted by 15A NCAC 19C .0600.

2. "North Carolina Occupational Safety and Health Standards for the Construction Industry," 29 CFR Part 1926 as adopted by T13 NCAC 07F .0201, and shipyard T13:07F.0500.

3. North Carolina General Statutes, Chapter 95, 97, 130.

D. The following documents published by the American National Standards Institute:

1. "Fundamentals Governing the Design and Operation of Local Exhaust Systems," Z9.2-1979.

2. "American National Standard for Respiratory Protection Respiratory Use - Physical Qualifications for Personnel," Z88.6-1984.

3. "Practices for Respiratory Protection," Z88.2-1992.

1.02 NOTICES

A. The contractor shall notify the following offices in writing within the time frame specified by the NESHAP regulations prior to beginning any asbestos removal operations.

1. State Agencies

Health Hazards Control Unit
Occupational & Environmental Epidemiology Branch
N.C. Department of Health and Human Services
(Regular Mail)
1912 Mail Service Center
Raleigh, N.C. 27699-1912
Telephone: (919) 707-5900
Fax: (919) 870-4807

N.C. Department of Labor
Division of Occupational Safety and Health
1101 Mail Service Center
Raleigh, N.C. 27699-1101
Telephone: 1-800-NC-LABOR or (919) 625-2267

2. Licenses

Maintain current licenses for contractor and accreditation for workers and supervisors as required by applicable State or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract.

SECTION 01410

AIR MONITORING - INDUSTRIAL HYGIENE FIRM

1.01 GENERAL

A. The designer shall be responsible for the coordination of industrial hygiene firm. Services of the industrial hygiene firm will be paid by the owner.

B. Air monitoring shall be done under the direct supervision of a North Carolina accredited supervising air monitor (SAM), except for sampling performed by the contractor to satisfy OSHA requirements.

C. SAM shall be accredited per the Asbestos Hazard Management Program rules.

D. Air monitor shall be accredited as per the Asbestos Hazard Management Program rules and work under the direct supervision of a SAM.

E. The SAM representing each firm shall have taken a 24-hour respiratory protection course that is either NIOSH, AIHA or HHCU recognized.

F. The industrial hygiene firm shall submit copies of their N.C. accreditations and documentation on respiratory protection training to the designer prior to the award of the contract.

G. If specific project activities are assigned to an air monitor, the SAM is expected to be in direct control and responsible for industrial hygiene work completed on the project. The SAM shall approve and sign all air monitoring results performed by the air monitor. The SAM signature must be an original. No rubber stamp signature shall be accepted.

H. Employees of the HHCU shall have right of entry into the project. The HHCU's SAM shall have final authority over the industrial hygiene firm on the project.

1.02 DESCRIPTION OF WORK

A. The industrial hygiene firm shall offer expertise to the designer and contractor but is not directly responsible for the performance of the job.

B. At the job site, the industrial hygiene firm is expected to observe, be aware, and comment on general work site conditions and activities as they relate to the specifications and profession of industrial hygiene, and make recommendations in writing to the designer and contractor.

C. The industrial hygiene firm is responsible for overseeing the protection of the environment from contamination, protection of persons in adjacent areas, and assurance that the areas are acceptable for occupancy.

D. The industrial hygiene firm has the authority to direct the contractor relative to safety and environmental concerns. This includes stopping the work if necessary. All directions and comments made by the industrial hygiene firm to the contractor shall be written with a copy to the designer.

E. The industrial hygiene firm shall furnish the contractor a copy of his field report within 24 hours of the visit. Copies of field notes and reports of observations shall be kept in project log book.

F. The SAM shall review and make comments to the designer on the submittals listed in Section 01043.

G. The SAM shall approve any change in contractor's respiratory protection. This includes a review of the historical data.

H. The industrial hygiene firm is to conform to the contractor's schedule and shall respond to necessary changes, provided an advance notice is given as outlined in Section 01043.

I. The industrial hygiene firm's project monitor shall furnish designer and contractor with a pager or mobile phone number where he can be reached quickly at all times.

J. The industrial hygiene firm shall notify the designer and contractor, in writing, of any failed clearance visits.

K. At the completion of the project, the industrial hygiene firm shall prepare a report describing the assessment of the project, all air monitoring data, acceptance letters, calibration records, and a description of the project as it proceeded to completion and submit four copies of the report to the designer.

1.03 AIR MONITORING

A. Ambient Air Monitoring: The purpose of ambient air monitoring by the industrial hygiene firm will be to detect discrepancies in the work area isolation such as:

1. Contamination of the building outside of the work area with airborne asbestos fibers.

2. Failure of filtration or rupture in the negative pressure system.

3. Confirm the work practices established by the contractor and respiratory protection provided for employees are adequate.

B. Work Area Clearance: To determine if the elevated airborne fiber levels encountered during abatement operations have been reduced to an acceptable level, the industrial hygiene firm will sample and analyze air per Section 01714.

C. In accordance with AHMB Program Rules, the SAM shall develop an Abatement Project Monitoring Plan which complies with EPA and OSHA analytical criteria and will provide a valid representation of airborne fiber concentrations both inside and outside the work area. This program is not intended to satisfy the contractor's

requirement for sampling under the OSHA regulation. All personnel and area sampling conducted by the industrial hygiene firm shall be personally observed. Air sampling pumps shall not be left unattended for extended periods of time.

1. The SAM shall submit a written project monitoring plan to the designer with a copy to the contractor. The following information shall be required for the submittal.

    a. The name, address and telephone number of the industrial hygiene firm.

    b. The name, address, telephone number and NIOSH's PAT designation and proficiency data for the laboratory analyzing the air samples. Analysis of all samples collected shall be by a laboratory currently proficient in NIOSH's "Proficiency Analytical Testing Program for Laboratory Quality Control" for asbestos. The acceptable sampling and analysis method is NIOSH 7400, latest revision.

        Persons performing phase contrast microscopy analysis at the asbestos removal location shall be proficient in the American Industrial Hygiene Association’s Asbestos Analyst Registry Program [AAR].

    c. A proposed air sampling strategy which shall include: a projected number of air samples, locations, the types of air samples to be collected (personal, area, ambient), how the air samples are to be collected (TWA, ceiling, other), the equipment to be used (pumps, calibration equipment, filters, other), and how the samples will be transported to the laboratory.

        1. All personal air samples will be collected in such a manner as to comply with OSHA collection and analytical regulations and to provide a valid representation of airborne fiber levels. The samples collected by the industrial hygiene firm on personnel do not satisfy the contractor’s responsibility under OSHA.

        2. All final area air sampling will comply with all State and Federal requirements in measuring airborne asbestos following an abatement action.

        3. Air samples will be analyzed, and results made available as per the AHMB Program Rules. Copies of all air sampling results shall be signed by the SAM and a copy posted at the job site. These copies shall include the following: sample number, sample location, activity represented by sample, flow rate, sample time, comments and sample results. A statement will be included on each submission that the requirements of this contract have been met as they apply to the activities of the SAM.

4. If TWA samples are being collected by the contractor for the purpose of reducing respiratory protection requirements, the industrial hygiene firm shall directly observe the conditions and work practices represented by each sample and make appropriate notes in the bound book on site. The SAM shall review all TWA air sampling results which are used for reducing respiratory protection requirements before accepting the results.

D. Supplemental air monitoring may be conducted inside and outside the work area by the HHCU. This supplemental sampling does not fulfill air monitoring responsibilities required by OSHA, EPA or this contract.

SECTION 01503

TEMPORARY FACILITIES

1.01 GENERAL

A. Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.

B. Use qualified tradesmen for installation of temporary services and facilities. Locate, modify and extend temporary services and facilities where they will serve the project adequately and result in minimum interference with the performance of the work.

C. In occupied buildings, the owner's maintenance personnel shall lock and tag out all electrical and HVAC equipment in the asbestos abatement area. The contractor shall verify that the power and HVAC have been locked and tagged out prior to beginning work.

D. In unoccupied buildings, the contractor is responsible for the lock and tag out of all power sources and HVAC equipment.

E. The owner shall move all furniture, books, computers, records, equipment, etc. prior to the contractor's arrival date as specified.

1.02 WATER SERVICE

A. The contractor shall supply a source of potable water. Contractor bears all expense of heating and getting potable water to the work and decontamination areas.

B. Supply potable hot and cold water to the decontamination unit in accordance with Section 01563. Hot water shall be supplied at a minimum temperature of 100 degrees Fahrenheit.

C. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment.

1.03 ELECTRICAL SERVICE

A. General: Comply with applicable NEMA, NEC and UL standards and governing state and local regulations for materials and layout of temporary electric service.

B. Ground Fault Protection: Provide receptacle outlets equipped with ground fault circuit interrupters, reset button and pilot light, for plug-in connection of power tools and equipment.

C. Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity and power characteristics to accommodate performance of work during the construction period.

D. Install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of work.

E. Provide services of an electrician, on a standby basis, to service electrical needs during the abatement process.

F. Provide additional power service and distribution service, consisting of individual dedicated 15-amp 120-volt circuits to electrical drops with receptacle outlets equipped with ground fault interrupt protection, color coded for the exclusive use of the industrial hygiene firm.

G. Power is not available at the site. The contractor must provide a generator or establish a temporary source of power for the duration of the project. **Power may not be turned off on nights or weekends if there is an active containment.**

1.04 FIRST AID

A. A minimum of one first aid kit shall be located in the clean room. Additional first aid kits as the contractor feels is adequate or is required by law shall be located throughout the work area.

1.05 FIRE EXTINGUISHERS

A. Comply with the applicable recommendations of NFPA Standard 10 - "Standard for Portable Fire Extinguishers." Locate fire extinguishers where they are most convenient and effective for their intended purpose but provide not less than one extinguisher in each work area equipment room and one in the clean room of the personnel decontamination unit.

1.06 TOILET FACILITIES

A. Provide temporary toilet facilities to be used by contractor's employees. Use of the owner's existing toilet facilities will be at owner’s discretion and these privileges may be revoked at any time.

1.07 PARKING

A. Park only in areas designated by the owner.

1.08 BUILDING SECURITY

A. Maintain personnel on-site at all times any portion of the work areas are open or not properly secured. Secure work areas completely at the end of each day.

1.09 STORAGE

A. Supply temporary storage required for storage of equipment and materials for duration of project. Trailer and storage dumpsters will be maintained in areas designated by the owner.

SECTION 01513

NEGATIVE PRESSURE SYSTEM

1.01 GENERAL

A. High efficiency particulate air (HEPA) filter exhaust systems equipped with new HEPA filters for each project shall be used. Exhaust equipment and systems shall comply with ANSI Z9.2-79 and used according to manufacturer's recommendations.

B. A system of HEPA-equipped air filtration devices shall be configured so that a pressure differential is established between the work area and the surrounding area (-0.02 to -0.04" water column). A continuous chart-recorded manometer shall be used to confirm this condition.

C. Additional air filtration devices shall be provided inside the work area for emergency standby as well as for circulation of dead air spaces.

D. The pressure differential is maintained at all times after preparation is complete and until the final visual inspection and air tests confirm the area is clean and acceptable for occupancy and the designer confirms verbally with written follow-up to discontinue the use of the negative pressure system.

E. Air shall be exhausted outside the building. Any variations must be approved by the HHCU.

F. The contractor shall check daily for leaks and log his checks in the bound logbook. This includes checks internal to air-moving devices.

G. There shall be a minimum of four air changes per hour in any containment.

SECTION 01526

WORK AREA PREPARATION

1.01 GENERAL

A. Before work begins in an area, a decontamination unit must be in operation as outlined in Section 01563.

B. Completely isolate the work area from other parts of the building so as to prevent contamination beyond the isolated area.

C. Temporary facilities shall be addressed as outlined in Section 01503.

D. The contractor shall set up a work area, load out, and decontamination area as shown in the plans and specifications. Any variations must be approved by the designer. The decontamination facility outside of the work area shall consist of a change room, shower room and equipment room as described in Section 01563.

E. The contractor shall wet clean and/or HEPA vacuum all items and equipment in the work area suspected of being contaminated with asbestos, but not in direct contact with the asbestos material and either secure these items in place with polyethylene sheeting or have them removed from the work area.

F. Critical Barriers: The contractor shall thoroughly seal the work area for the duration of the work by completely sealing off all individual openings and fixtures in the work area, including, but not limited to, heating and ventilation ducts, doorways, corridors, windows, skylights and lighting, with polyethylene sheeting taped securely in place. If the contractor is using sealant materials to fill in small holes or cracks, the material shall have appropriate fire ratings.

G. Floors (if required): Apply one or more layers of 6 mil (minimum) polyethylene plastic sheeting with joints overlapped 24 inches and taped securely. Plastic shall be carried up walls a minimum of 12 inches and secured.

H. Walls (if required): Apply one or more layers of 4 mil (minimum) polyethylene plastic sheeting with joints lapped 24 inches and taped securely. Plastic shall be lapped over floor coverings and taped securely.

I. Floors and walls (if required) shall be installed in such a manner that they may be removed independently of the critical barriers.

J. Entrances and exits from the work area will have triple barriers of polyethylene plastic sheeting so that the work area is always closed off by one barrier when workers enter or exit.

K. No water may be left standing on the floor at the end of the workday.

L. Floor surfaces, walls, finishes or coverings, etc., that in the contractor’s opinion will likely be damaged by water or that may become contaminated with asbestos, shall

have additional protective preparation as the contractor sees appropriate, at his cost, to protect the original condition of the surfaces.

M. Any costs associated with physical damage caused by water or securing polyethylene sheeting to areas inside or outside the abatement area shall be the contractor's responsibility.

N. The contractor shall establish and mark emergency and fire exits from the work area. Emergency procedures shall have priority over established decontamination entry and exit procedures. Audible and visible fire and emergency evacuation alarms shall be installed so as to be heard and seen throughout the entire work area.

O. Integrity of these seals shall be regularly checked and maintained by the contractor.

P. After work area preparation, the contractor shall notify the designer verbally with written follow-up that he is ready for a prework inspection.

SECTION 01560

WORKER PROTECTION

1.01 GENERAL

A. Provide worker protection as required by OSHA, state and local standards applicable to the work. Contractor is solely responsible for enforcing worker protection requirements at least equal to those specified in this Section.

B. Each time the work area is entered the contractor shall require all persons to remove all street clothes in the changing room of the personnel decontamination unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.

C. Workers shall not eat, drink, smoke, chew gum or chew tobacco in the work area, the equipment room, the load out area, or the clean room.

1.02 WORKER TRAINING

A. Train all workers in accordance with 29 CFR 1926 and North Carolina state regulations regarding the dangers inherent in handling asbestos, breathing asbestos dust, proper work procedures and personal and area protective measures.

1.03 MEDICAL EXAMINATIONS

A. Provide medical examinations for all workers. Examination shall as a minimum meet the OSHA requirements as set forth in 29 CFR 1926 and N.C.

1.04 PROTECTIVE CLOTHING

A. Provide disposable full-body coveralls and disposable head covers and require that they be worn by all workers in the work area. Provide a sufficient number for all required changes, for all workers in the work area.

B. Boots: Provide work boots with non-skid soles and, where required by OSHA, foot protection for all workers.

C. Gloves: Provide work gloves to all workers and require that they be worn at the appropriate times. Do not remove gloves from work area. Dispose of work gloves as asbestos-contaminated waste at the completion of the project.

1.05 ADDITIONAL PROTECTIVE EQUIPMENT

A. Disposable coveralls, head covers, and footwear covers shall be provided by the contractor for the owner, the designer, Industrial hygiene firm and other authorized representatives who may inspect the job site.

1.06 DECONTAMINATION PROCEDURES

A. Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the work area:

1. Remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.

2. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum:

   a. Thoroughly wet body including hair and face.

   b. With respirator still in place thoroughly wash body, hair, respirator face piece, and all exterior parts of the respirator.

   c. Take a deep breath, hold it and/or exhale slowly, completely wet hair, face and respirator. While still holding breath, remove respirator and hold it away from face before starting to breathe.

   d. Carefully wash face piece of respirator inside and out.

   e. Shower completely with soap and potable water; rinse thoroughly.

   f. Rinse shower room walls and floor prior to exit.

   g. Proceed from shower to changing (clean) room and change into street clothes or new disposable work items.

3. After showering, each employee shall inspect, clean and repair his respirator as needed. The respirator shall be dried, placed in a suitable storage bag and properly stored.

SECTION 01562

RESPIRATORY PROTECTION

1.01 DESCRIPTION OF WORK

A. Instruct and train each worker involved in asbestos abatement in proper respirator use and require that each worker always wear a respirator, properly fitted on the face, in the work area from the start of any operation which may cause airborne asbestos fibers until the work area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the workplace or as required for other toxic or oxygen-deficient situations encountered.

1.02 GENERAL

A. Provide workers with personally issued and marked respiratory equipment approved by NIOSH and MSHA and suitable for the asbestos exposure level in the work areas according to OSHA Standard 29 CFR 1926.1101 and other possible contaminants employees might be exposed to during the project.

B. Provide respiratory protection from the time the first operation involved in the project requires contact with asbestos-containing materials (including construction of decontamination units, construction of airtight barriers/barricades, and placing of plastic sheeting on walls) until acceptance of final air clearance test results by the industrial hygiene firm.

C. The minimum respiratory protection for the project shall be half-face air purifying respirators (APR).

D. Respirator fit testing shall be performed as a minimum at the beginning of the project, at any change in respiratory protection equipment, and at any time during the project if requested by the employee or SAM. Fit testing is to be performed by one of the methods listed in the 29 CFR 1926.1101, Appendix C.

E. Do not allow the use of single-use, disposable or quarter-face respirators for any purpose.

SECTION 01563

DECONTAMINATION UNITS

1.01 DESCRIPTION OF WORK

A. Provide separate personnel and equipment/loadout decontamination facilities. Require that the personnel decontamination unit be the only means of ingress and egress for the work area. Require that all materials exit the work area through the equipment/loadout decontamination unit. Contractor shall comply with 29 CFR 1926.1101, specifically paragraph (j) Hygiene facilities and practices for employees.

1.02 GENERAL

Provide separate personnel decontamination units and equipment/loadout decontamination units when practical.

A. Personnel Decontamination Unit

1. Provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces, changing room, shower room, equipment room. Each shall be separated by a minimum of three curtain doorways. Require all persons without exception to pass through this decontamination unit for entry into and exiting from the work area for any purpose. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit.

2. Provide temporary lighting within decontamination units as necessary to reach an adequate lighting level.

3. Maintain floor of changing room dry and clean at all times. Do not allow the overflow water from the shower to escape the shower room.

4. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

5. Provide hot and cold water, drainage and standard fixtures including an elevated shower head as necessary for a complete and operable shower. A water hose and bucket is not an acceptable shower.

6. Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the work area.

7. Pump shower wastewater to drain. Provide 20 micron and 5-micron waste water filters in line to drain. Change filters daily or more often if necessary.

8. If the decontamination area is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a

minimum 3/8-inch plywood "ceiling" with two layers of polyethylene sheeting covering the top of the "ceiling."

9. Visual Barrier: Where the decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque plastic sheeting so that worker privacy is maintained, and work procedures are not visible to building occupants. Where the area adjacent to the decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs, max. 16 inches on center, covered with minimum 3/8-inch plywood.

B. Equipment Decontamination Units:

1. Provide an equipment decontamination unit consisting of a serial arrangement of rooms, clean room, holding area, and washroom, each room separated by a minimum of three curtain doorways, for removal of equipment and material from work area. Do not allow personnel to enter or exit work area through equipment decontamination unit.

2. Washroom: Provide washroom for cleaning of bagged or drummed asbestos-containing waste materials passed from the work area.

3. Holding Area: Provide holding area as a drop location for sealed drums and bagged asbestos-containing materials passed from the washroom.

4. Clean Room: Provide clean room to isolate the holding area from the building exterior or occupied areas.

5. Equipment or Material: Obtain all equipment or material from the work area through the equipment decontamination unit according to the following procedure:

a. When passing contaminated equipment, sealed plastic bags, drums or containers into the washroom, close all doorways of the equipment decontamination unit, other than the doorway between the work area and the washroom. Keep all outside personnel clear of the equipment decontamination unit.

b. Once inside the washroom, wet-clean the bags and/or equipment.

c. When cleaning is complete, insert bagged material into a clean bag/drum during the pass between the washroom and holding area. Close all doorways except the doorway between the washroom and holding area.

d. Workers from the building exterior enter the clean room then the holding area to remove decontaminated equipment and/or containers for disposal. Require these workers to wear full protective clothing and respiratory protection as described in Section 01562.

C. Use of Elevator:

1. If the elevator is used for transport of material, it shall be prepared with two layers of 6 mil polyethylene plastic sheeting that meets the approval of the designer. The elevator shall be cleaned daily after each use.

D. Decontamination Unit Contamination:

1. If the air quality in the decontamination unit exceeds 0.01 fibers per cc analyzed by PCM or 70 structures per mm squared analyzed by TEM or its integrity is diminished through use as determined by the designer or industrial hygiene firm, no employee shall use the unit until corrective steps are taken and approved by the designer and industrial hygiene firm.

SECTION 01711

PROJECT DECONTAMINATION

1.01 GENERAL

A. Carry out a first cleaning of all surfaces of the work area including plastic sheeting, tools, scaffolding and/or staging by use of damp-cleaning and mopping and/or a high efficiency particulate air (HEPA) filter vacuum until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces. Do not perform dry-dusting or dry-sweeping.

B. Equipment shall be cleaned, and all contaminated materials removed before removing polyethylene from the walls and floors.

C. The contractor shall replace all prefilters and clean the inside and outside of the HEPA exhaust units.

D. After polyethylene sheets have been removed from walls and floors, but are still remaining on all windows, doors and the critical components, the contractor shall clean all surfaces in the work area, including ducts, electrical conduits, steel beams, roof deck, etc., with amended water and/or HEPA-filtered vacuum.

E. After cleaning the work area, the contractor shall allow the area to thoroughly dry and then wet-clean and/or HEPA vacuum all surfaces in work area again.

F. At the completion of the cleaning operation, the contractor's supervisor shall perform a complete visual inspection of the work area to ensure that the work area is dust- and fiber-free. If the supervisor believes he is ready for a final project decontamination inspection, he shall notify the designer.

G. The designer shall contact the industrial hygiene firm and advise the firm of the final project decontamination inspection requested by the contractor.

H. Final project decontamination inspection includes the visual inspection and air monitoring clearance.

I. Visual inspection for acceptance shall be performed after all areas are dry.

J. The industrial hygiene firm shall perform the final visual inspection and conduct the final air clearance. Any discrepancies found shall be documented in the form of a punch list.

K. Final air sampling shall not commence until the visual inspection is completed and passed, and the area is misted with an encapsulant.

L. If the industrial hygiene firm finds that the work area has not been adequately decontaminated, cleaning and/or air monitoring shall be repeated at the contractor’s expense, including additional industrial hygiene fees, until the work area is in compliance.

M. After the work area is found to be in compliance, all entrances and exits shall be unsealed and the plastic sheeting, tape and any other trash and debris shall be disposed of in sealable plastic bags (6 mil minimum) and disposed of as outlined in Section 02084.

N. All HEPA unit intakes and exhausts shall be wrapped with six mil polyethylene before leaving the work area.

O. After the industrial hygiene firm has approved the final project decontamination and the contractor has completed the tear down for occupancy by others, the designer shall perform the project final inspection as outlined in the general conditions.

P. Any residual asbestos that may be present after removing critical barriers, that in the designer’s judgment should have been cleaned during the precleaning phase prior to installing critical barriers, shall be cleaned and cleared at the contractor’s expense.

Q. There shall be appropriate seals totally enclosing the inspection area to keep it separate from clean areas or other areas where abatement is or will be in progress. Once an area has been accepted and passed air tests, loss of the critical barrier integrity or escape of asbestos into an already clean area shall void previous acceptance and tests. Additional visual and final air clearance sampling shall be required at the contractor's expense.

SECTION 01714

WORK AREA CLEARANCE

1.01 GENERAL

A. Notification and scheduling of the final inspection during the project is the responsibility of the contractor.

1.02 FINAL CLEARANCE TESTING

A. After the second cleaning operation and after the area is completely dry, the following procedure test shall be performed:

1. A final visual inspection shall be conducted by the industrial hygiene firm. The inspection shall be conducted following the guidelines set forth in the American Society for Testing and Materials, Standard Practices for Visual Inspection of Asbestos Abatement Projects, Designation: E1368.90. If the work area is found visibly clean, air samples will be collected by the industrial hygiene firm.

2. During the air testing, the accredited air monitor shall cause disruptive air currents as described in the EPA-AHERA regulations (40 CFR Part 763, Subpart E, Appendix A).

3. If samples are to be analyzed using PCM (minimum of five samples using NIOSH 7400 method), then the maximum flow rate is 12 liters per minute, with a minimum sample size of 2000 liters for each sample. Clearance criteria shall be less than 0.01 F/cc for all samples analyzed.

4. If samples are to be analyzed using TEM, the Mandatory Transmission Electron Microscopy Method described in 40 CFR Part 763, Subpart E, Appendix F shall be used. Clearance criteria shall be an arithmetic mean less than or equal to 70 structures per square millimeter or a z-test less than or equal to 1.65.

5. Final clearance criteria shall be in accordance with AHMB Program Rules. ***{Clearance air sampling will be by TEM}***

6. The industrial hygiene firm shall immediately report the final air sampling clearance results to the designer.

7. The use of the negative pressure system may be discontinued after the industrial hygiene firm instructs the contractor that he has passed the final project decontamination inspection.

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SECTION 02080

ASBESTOS REMOVAL

1.01 GENERAL

A. Prior to starting asbestos removal, the contractor's equipment, work area and decontamination units will be inspected and approved by the designer.

B. All loose asbestos material removed in the work area shall be adequately wet, bagged, sealed and labeled properly before personnel breaks or end of shift.

C. All plastic sheeting, tape, cleaning material, clothing and all other disposable material or items used in the work area shall be packed into sealable plastic bags (6 mil minimum) and treated as contaminated material.

D. All material shall be double-bagged.

E. All excess water (except shower water) shall be combined with removed material or other absorptive material and properly disposed of as per EPA regulations. Contractor shall not place water in storm drains, onto lawns, or into ditches, creeks, streams, rivers or oceans.

1.02. SCOPE OF WORK

FORMER WILLOWBROOK MILL
215 BONVIEW AVENUE
LINCOLNTON, NORTH CAROLINA

Asbestos material to be removed:

Sample Number	Sample Description	Material Location	Percent/Type Asbestos	Estimated Quantity
1	White Block Pipe Insulation	Throughout and in Crawlspace	5% Chrysotile 5% Amosite	12,000 Linear Feet
2	Mastic on Foam Glass Pipe Insulation	Throughout	10% Chrysotile	350 Linear Feet
5	Floor Tile	Production Room 1	5% Chrysotile	4,760 Square Feet
	Mastic	Production Room 1	3% Chrysotile	
6	Wall Panel Insulation	HVAC Rooms at Basement, 1st Floor and Roof	50% Chrysotile	640 Square Feet
7	Electrical Box Insulation	1st Floor HVAC Room	50% Chrysotile	5 Square Feet

Sample Number	Sample Description	Material Location	Percent/Type Asbestos	Estimated Quantity
8	White Block Pipe Insulation	Throughout and in Crawl Space	60% Chrysotile	Included in quantity for sample #1
9	Insulating Boards	HVAC Rooms at Basement, 1st Floor and Roof	50 % Chrysotile	Included in quantity for sample #6
11	Tank/Boiler Insulation	Boiler Room	60% Chrysotile	365 Square Feet
12	Floor Tile	Basement	10% Chrysotile	Included in quantity for sample #5
12	Mastic	Basement	5% Chrysotile	
14	Floor Tile	Basement	10% Chrysotile	
	Mastic	Basement	5% Chrysotile	
15	Floor Tile	Basement	10% Chrysotile	
	Mastic	Basement	5% Chrysotile	
16	Floor Tile	Basement	5% Chrysotile	
	Mastic	Basement	5% Chrysotile	
17	Floor Tile Mastic	Basement	3% Chrysotile	
18	Silver Paint on Foam-Glass	Boiler Room	3% Chrysotile	350 Linear Feet
	Tar on Foam-Glass	Boiler Room	10% Chrysotile	
19	Steam Pipe Insulation	Boiler Room	10% Amosite	Included in quantity for sample #1
20	Built-Up Roofing	Roof	15% Chrysotile	70,000 Square Feet
21	Built-Up Roofing	Roof	15% Chrysotile	Included in quantity for sample #20
22	Steam Pipe Insulation	Boiler Room	20% Amosite	Included in quantity for sample #1

[1] Quantities are estimates: SF = square feet, LF = linear feet.

Wall and floor mounted equipment remaining in the work areas will be cleaned by contractor before critical barriers are put in place.

Friable ACM will be removed with critical barriers on the windows, doorways, openings to outside, and equipment mounted on walls and walls will be covered. All walls will have a minimum of one layer of 6-mil polyethylene sheeting.

ACM shall be abated under negative air pressure using HEPA units. A three stage decon and loadout will be setup at the doorway of work areas. The decon must be constructed to prevent unauthorized persons from entering the work site if the unit is located outside

the building. All surfaces will be wet wiped as part of final cleaning. Negative pressure of 0.02" water column must be maintained at all times. Negative pressure recorder is required for the duration of project.

Contractor must have a NC-HHCU accredited supervisor on site at all times and all workers must be accredited by HHCU.

Workers will be required to wear disposable suits, ½ face respirators, safety glasses and boots.

Contactor must follow OSHA guidelines and required to conduct personal air monitoring on workers and furnish the Designer and Owner results within 48 hours.

Final inspection will be visual and conducted by the Designer and Environmental Monitoring firm. Final air clearances will be by TEM.

All asbestos materials will be properly wet, double bag, labeled, stored in a line trailer or container for shipping and disposal of in a State/EPA approved landfill.

All work practices, equipment, containment setup, and personal protective equipment must follow State, Federal and local agencies guidelines. All personnel shall be currently accredited by NC-HHCU.

Upon completion of work the contractor shall provide the following documentation: copies of accreditations, training certificates, and medical surveillance records for the project personnel, sign-in sheets and/or field logs, and waste disposal manifest.

Asbestos roofing shall be removed from the intact buildings. Contractor is responsible for determining the structural integrity of the roofs prior to working on the roof.

The collapsed portion of the building will be disposed of as asbestos-contaminated waste. No segregation of porous materials will be allowed. The mechanical rooms located on the side of the collapsed portion of the building may be abated under negative pressure and then demolished and disposed of as non-ACM construction debris. Material will be kept wet during removal and placed into dumpsters lined with minimum of 6-mil polyethylene sheeting.

Pipe insulation in the crawlspace shall be removed using either glove bags, full containment, or cut and wrap. The soil throughout the crawlspace is contaminated with asbestos pipe insulation debris. The contractor shall pick up all visible asbestos debris and rake through the top layer of the soil to remove visible pipe insulation debris.

Following a passing visual clearance within the crawlspace, contractor shall install a minimum of 6-mil polyethylene sheeting in the crawlspace. Contractor will post asbestos warning signs at the entrances to the crawlspace to alert future users of the potential hazard in the soil.

Pipes with ACM insulation located throughout the facility may be wrapped and cut, abated by glove bag or the insulation may be removed from the pipes within a full containment.

SECTION 02084

DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIAL

1.01 GENERAL

A. All asbestos materials and miscellaneous contaminated debris shall be properly sealed and protected, and the loadout vehicle/dumpster shall be locked, while located on the facility site and then transported to a predestinated disposal site in accordance with 40 CFR 61.150 and DOT 49 CFR Parts 100-399.

B. An enclosed vehicle will be used to haul waste material to the disposal site. No rental vehicles or trailers shall be used. Vehicle selection, vehicle covers, and work practices shall assure that no asbestos becomes airborne during the loading, transport and unloading activity, and that material is placed in the waste site without breaking any seals.

C. Waste disposal polyethylene bags (6 mil) and containers, non-porous (steel/plastic) drums or equivalent, with labels, appropriate for storing asbestos waste during transportation to the disposal site shall be used. In addition to the OSHA labeling requirements, all containers shall be labeled with the name of the waste generator and the location at which the waste was generated.

D. The contractor shall transport the containers and bags of waste material to the approved waste disposal site. The sealed plastic bags shall be placed into the burial site unless the bags have been broken or damaged. Upon the landfill's approval damaged bags shall be left in the non-porous containers and the entire contaminated package shall be buried. Uncontaminated containers may be reused.

E. Workers loading and unloading the asbestos will wear respirators and disposable clothing when handling material. Asbestos warning signs shall be posted during loading and unloading of asbestos waste.

F. The contractor shall use the HHCU's Waste Shipment Record for disposal records as per 40 CFR 61.150 and distribute a copy of all waste shipment records to the designer after the completion of the project.

SECTION 02085

OTHER HAZARDOUS MATERIALS

The Contractor is responsible for the removal and disposal of other hazardous materials in accordance with all current applicable rules and regulations. These other hazardous materials may include, but not be limited to, batteries, chemicals, refrigerant associated with compressors, glycol or other chemicals in chilled water or steam lines, oils, paints, hydraulic equipment and oils, fluorescent light bulbs, PCB-containing light ballasts, and lead-based or lead-containing paints on surfaces.

Loose and flaky lead-based and lead-containing paint shall be removed to the substrate by chemical removal, manual scraping or blasting with grit media. All waste material shall be tested by Toxicity Characteristic Leaching Procedure (TCLP) and disposed of in accordance with all current applicable rules and regulations.

A. The contractor shall furnish all labor, materials, services, insurance, bonding and equipment necessary to remove these materials.

B. The contractor shall be responsible for inspecting the site prior to bidding to confirm the scope of work. The above list is provided as an estimate. The actual quantities to be encountered are the responsibility of the contractors.

C. The contractor shall submit a copy of the waste manifest for the above listed materials in the post-job submittals.

D. Clearance for the above referenced materials will be visual.

APPENDIX A

PREWORK ASBESTOS INSPECTION CHECKLIST

Name of Facility: _____

Project Name: _____

Project ID Number:_____

Date of Inspection: _____ Pass: _____ Fail:_____

A. DOCUMENTS	YES	NO
1. Asbestos Removal Permit/NESHAP Notification	_____	_____
2. Accreditation Documents for Workers & Supervisors	_____	_____
3. Asbestos Plans and Specifications	_____	_____
4. Air Monitoring Data	_____	_____
5. Waste Shipment Records	_____	_____
6. Sign-in Sheets and Bound Book for Comments	_____	_____
7. Calibration Record for Grade “D” Air	_____	_____
8. Items listed in Section 01043 of Specification	_____	_____
B. PPE SUPPLIES		
1. Tyvek Clothing	_____	_____
2. Rubber Boots	_____	_____
3. Respirators with HEPA Filters	_____	_____
C. CLEAN ROOM		
1. Entry Curtains	_____	_____
2. Emergency Phone Numbers Posted	_____	_____
3. First Aid Kit	_____	_____
4. Asbestos Signs	_____	_____
5. Decontamination Procedures Posted	_____	_____
6. Fire Extinguisher	_____	_____
D. **SHOWER ROOM**		
1. Polyethylene Curtains	_____	_____
2. Hot/Cold Water & Operational	_____	_____
3. Soap & Towels	_____	_____
4. Waste Water Filter Pump Operational	_____	_____
5. Extra Five Micron Size Filters	_____	_____
6. Filtered Waste Water to Sanitary Sewer	_____	_____

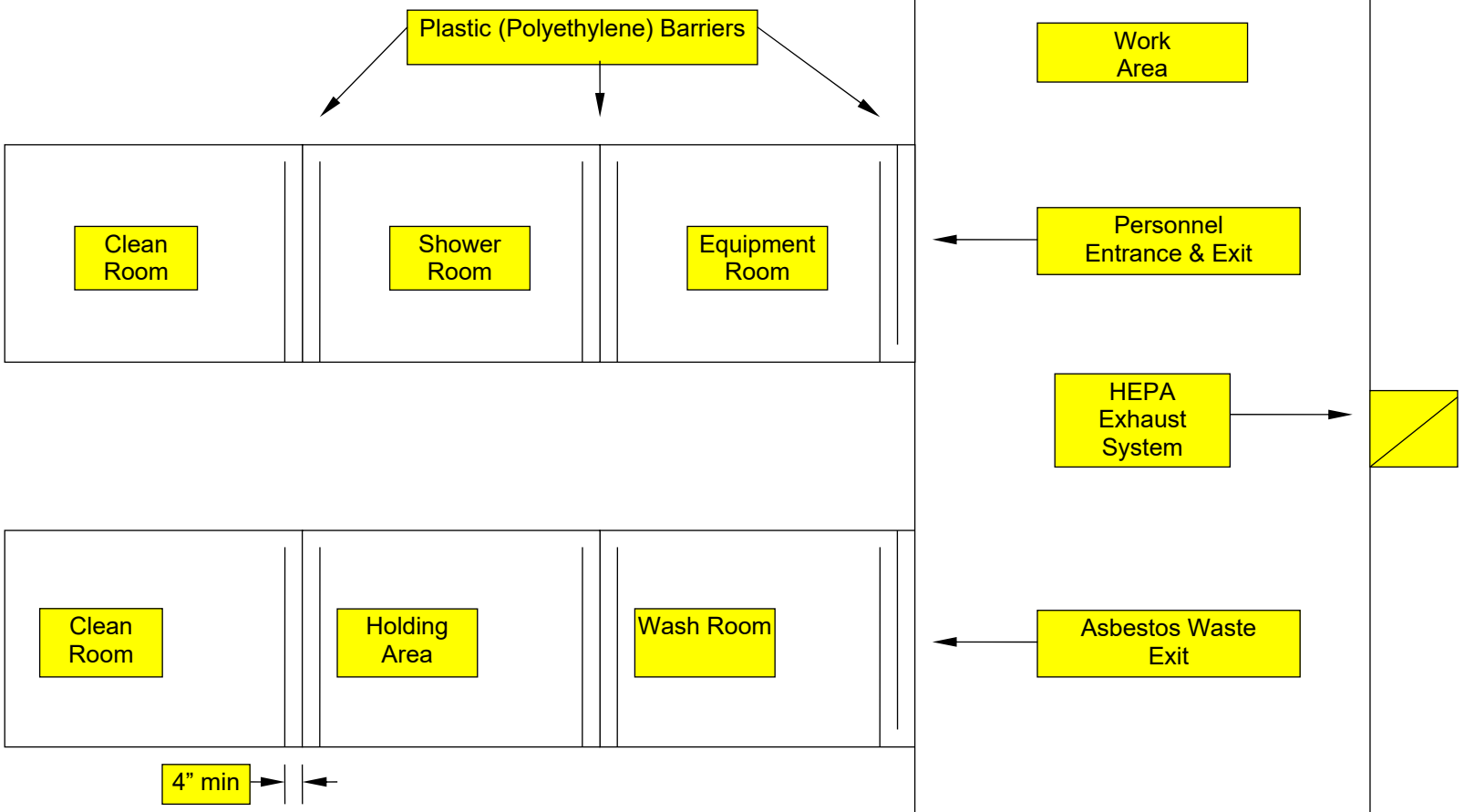
		YES	NO
E.	**WORK AREA**		
1.	Removable Items Out of Area	_____	_____
2.	Non-removable Items Protected	_____	_____
3.	Critical Barriers Installed	_____	_____
4.	Polyethylene Curtains	_____	_____
5.	Polyethylene on Walls/Floors as Specified	_____	_____
6.	HVAC off	_____	_____
7.	Air Filtration Devices in Place and Operational	_____	_____
8.	Air Exhausted to Outside	_____	_____
9.	Electricity Locked and Tagged Out	_____	_____
10.	Temporary Power Installed with GFCI	_____	_____
11.	Fire Extinguishers	_____	_____
12.	Emergency and Fire Exits Marked	_____	_____
13.	Audible Alarms Operational	_____	_____
14.	Toilet Available	_____	_____
F.	**EQUIPMENT**		
1.	Safety Equipment	_____	_____
2.	HEPA Vacuums	_____	_____
3.	Waste Disposal Bags	_____	_____
4.	Airless Sprayer with Water Source	_____	_____
5.	Cleaning Equipment	_____	_____
6.	Glove Bags	_____	_____
7.	Emergency Power Generator (if required)	_____	_____
8.	Temporary Lighting	_____	_____
G.	**OTHER**		
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

_____ _____

Asbestos Design Consultant *Date*

_____ _____

Asbestos Contractor's Representative *Date*



Decontamination Area Arrangement - Plan View

Drawn By:	Date:	N.C. Department of Administration State Construction Office Raleigh, N.C. 27601
GAD	01/02/96	